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ABSTRACT

American agriculture is seriously threatened by growing shortages of highly qualified scientists, managers, and technical professionals. This paper examines the work outcomes of agricultural college alumni who were previously surveyed as students in 1977. Questionnaires were completed by 1,917 graduates in agricultural majors at 1862 and 1890 land-grant colleges of agriculture. Findings revealed significant differences in complexity of tasks on the first full-time job between agribusiness and non-agribusiness job holders. Compared to non-agribusiness job holders, agribusiness job holders were more likely to be involved in more complex data- or people-related tasks, but less complex things-related tasks. On later jobs, these entry-level differences virtually disappeared. Gender (male) and academic major (agribusiness or applied engineering) were the strongest predictors of holding an agribusiness job, followed by the state's percentage of rural farm residents. Comparison of results with those of the 1977 study suggests that plans and aspirations for a particular occupation do not increase the probability of entering a particular career upon graduation from college. This report contains 23 references. (SV)

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Comparison of the Nature of Work Performed: Southern Land-Grant University Colleges of Agriculture Alumni*

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*This is part of the author's work on Southern Regional Research Project S-200 (Occupational Career Paths of Former Students in Southern Land-Grant Universities)

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Comparison of the Nature of Work Performed: Southern Land-Grant Colleges of Agriculture Alumni

Andrew A. Zekeri

Introduction

According to the resident instruction committee on organization and policy, Division of Agriculture, National Association of the State Universities and Land-Grant Colleges (NASULGC, 1983), American agriculture is seriously threatened by deepening shortages of highly qualified scientists, managers, and technical professionals. Without new efforts to develop its human capital, it is maintained that agriculture in the United States will lose its competitive edge in productivity. In recognition of the critical nature of this problem, USDA Joint Council on Food and Agricultural Sciences (1983:19) identified and ranked "scientific expertise development" as the second of eight priorities for the FY 1985 budget. Further, the Joint Council (1989:10) has reinforced the urgent need for "human capital development in food and agricultural sciences" by ranking it third of the five top national priorities for FY 1990 (NASULGC, 1989). Despite the above mentioned human capital shortage, the career profile of recent college of agriculture graduates has not received analytical attention of sociologists.

The purpose of this paper is twofold. The first purpose is that of identifying major differences, if any, in the nature of work performed by a sample of male and female agricultural graduates in agribusiness related

careers and their peers in nonagribusiness careers. The second purpose is to identify predictors of agribusiness relatedness of jobs held by these graduates.

No research has been found to be directly relevant to this proposed study of variables most predictive of college graduates who actually pursue agribusiness related careers and their nature of work. Most of the related research has dealt with the relationship between farm background variables and the labor force expectation of agricultural students in which comparisons have been made between students from farm backgrounds and students from nonfarm backgrounds (Lyson, 1979). Recent limited studies have examined the association of educational attainment and agribusiness relatedness of jobs (Zekeri, 1989; Zekeri and Wheelock, 1989).

Researcher cooperating on the Southern Regional Research Project S-114 examined the background characteristics and factors underlying career choices of students enrolled in colleges of agriculture and closely related curricula. This large scale study was done during the 1976-1977 academic year and involved a sampling frame of more than 4,000 students in both 1862 and 1890 Land-Grant Colleges and Universities in the South (Howel and Parent, 1979). Questionnaires were completed by 3,417 agricultural students. Information on background, high school and college experiences, life goals, and attitudes was obtained via mailed questionnaires. While this research has provided much information about students pursuing higher education in agriculture, it did not involve their labor force entry and work experiences.

Regarding the regional data set, Lyson (1979) reported that students who are likely to become farmers come from farm background, from homes

where the father is a full-time farmer, and homes where farming is the only source of income. Further, the author indicated that students whose parents came from farm background have a higher expectation to enter farming than students with nonfarm background. Molnar and Dunkelberger (1981) stated that among the 1890 sample, the expectation to farm is related to inheriting a farm, race and Future Farmers of America membership. Also, in 1862 sample their findings reveal a positive relationship between agricultural courses taken in high school, inheriting a farm and expectation to farm. All of these background variables could be expected to predict an agribusiness career if not farming itself.

Concerning gender differences, Lyson (1981) found that female agricultural students more often hailed from urban background than their male peers. Lyson further mentions that childhood residence, mother's education and work status, family income and father's occupational status differentiated female agricultural students from their male peers. This may suggest that gender and background variables would interact to differentiate those who are pursuing agribusiness related careers.

Expectations are shaped by the nature of industry structure. The percentage of individuals engaged in farming have a significant implication for graduates planning to enter agribusiness. From this structural perspective, the nature of agriculture industries or the extent to which agriculture contributes to the overall economy of a state will determine the number of agribusiness related career opportunities available for agricultural graduates. Lyson (1986:329) observed that "the nature and range of occupational opportunities and possibilities in a particular area affect career development patterns and socioeconomic attainment process."

While there must be many ad hoc disciplines level or department level inquiries into the career outcomes of alumni, very little if any of these efforts have found their way into the literature. Conclusions drawn from this analysis may be used by college of agriculture administrators and faculty to help young people capitalize upon their agricultural interests and the vast assets of colleges of agriculture. In doing so, colleges of agriculture can better provide for the human capital needs of our food system.

Conceptual framework

Traditionally, college of agriculture students have had a strong background in agriculture but recent studies have documented that most agricultural students at southern land-grant universities had no farming experience (60%) and hailed from urban homes (57%). Twenty seven percent were female (Dunkelberger et al, 1982).

Black youth may be less interested in agribusiness careers than their white peers because majority of the farms operated by blacks in the south are small (Coleman and Hall, 1979). However, this may not be true for those who actually chose to attend colleges of agriculture. In a study of 1977 students 23.6% of 1890 land-grant students and 19.9% of 1862 land-grant students came from farm (Dunkelberger et al, 1982). Since most of these contemporary agricultural students are from diverse backgrounds, they could be expected to enter a diverse set of careers. Whether they are agribusiness related or not, the nature of work involved would be expected to include similar tasks.

A generally accepted scheme to compare the "nature of work" across all

jobs has been developed in the Dictionary of Occupational Titles (1980 Census of Occupation). The scheme is based on the assumption that every job requires a worker to function in some degree with three phenomena: Data, People and Things. These functions can be expressed in terms of their complexity. The highest function when dealing with Data is synthesizing, monitoring is the highest in dealing with People and setting-up is the highest when dealing with Things. The lowest categories are comparing for Data related function, taking instruction for People related function and handling for Things related function. Jobs involving the most complex function are assumed to include functions of lesser complexity, but not the reverse. Since these functions taken together indicate the total range of complexity at which workers perform, I do not expect agribusiness job functions at the B.Sc. level to be different from other jobs in general.

To the extent, agricultural students who pursue agricultural professions are more likely to specialize by attaining advanced degrees, they may be expected to perform at a higher level of complexity. However, controlling for degree level, no significant difference in job complexity is expected between agribusiness careers and other careers. While no differences are expected with respect to the "nature of work" it is expected that background and subject matter interest variables will predict agribusiness relatedness of careers.

Agribusiness relatedness of jobs may be expected to vary by both major field of study at the undergraduate level and advanced degree study within agriculture disciplines. First, it is expected that obtaining an advanced degree will predict greater chance that agricultural graduates will be

employed in agribusiness related careers. Second, some majors in college of agriculture are more directly related to agribusiness careers than others. Traditional majors such as agronomy, animal science, agricultural economics, agricultural education and rural sociology may be expected to predict agribusiness related career more frequently than would more general biology or life science majors. Graduate education provides a more intense occupational socialization than does education at the undergraduate level. Ziman (1980) has noted that the professional nature of agricultural careers demands higher academic integration and that this results in the development of a norm (e.g. increasing numbers of agricultural workers are expected to have advanced degrees.). Zekeri and Wheelock (1989) found that among Alabama and Tennessee land-grant alumni, educational attainment had a positive impact on agribusiness relatedness of jobs. The authors indicated that the higher the level of educational attainment of agricultural students, the greater the tendency for them to pursue agribusiness related careers. This is consistent with the fact that agribusiness in the U.S. has moved to a high degree of specialization hand in hand with the development of sponsored research and graduate education in land-grant colleges.

Research Procedures

Data used in this study are from Southern Regional Research Project S-200 ("Occupational Career Paths of Former Students in Southern Land-Grant Universities"). This is a longitudinal study of 1862 and 1890 land-grant institutions alumni. The original regional sample frame was composed of 19,417 students enrolled at 1862 land-grant college of agriculture and

1,382 enrolled at 1890 land-grant colleges of agriculture for spring semester of 1977 in 13 southeastern states. A thirty percent systematic sample of students at 1862 land-grant colleges of agriculture and 100 percent of the students at 1890 land-grant colleges of agriculture were to be in the samples. The 30 percent sample is actually a composite of two 15 percent samples - S-114 (N=2,254 respondents) and Texas Agricultural and Mechanical University (TAMU, N=2,027 respondents). The combined sample response rate was 77% of the 5, 567. The 100 percent 1890 samples consists of 1,382 agricultural students enrolled in 1890 schools that participated in the same 1977 Cooperative State Research Service study (S-114). There was a 54% response rate (747 out of 1,382) for the 1890 land-grant colleges in 1977.

The current S-200 Regional Research Project (Career Paths of Former Students in Southern Land-Grant Universities) is a restudy of the S-114 and TAMU samples. The major focus of this study was on the actual labor market experiences of former students who graduated with B.S. degrees. From the 30% sample frame of 1862 land-grant college students 2,752 were relocated in 1986 and 2,049 returned questionnaires. This represents a 37% response rate based on the original 30% sample frame. Among the students at 1890 colleges of agriculture that participated in S-114 study in 1977 (N=1,382) 615 were relocated in 1986 and only 235 returned questionnaires. However, based on the original 100 percent sample frame the 1890 response rate is 17% (235 out of 1,382). For the present analysis, only data from graduates who completed their degrees in one of the agricultural majors (1,917) will be examined. Hence, any observed differences could not be due to variation in sample composition. (For details on the sampling and data

collection procedures, see Thomas et al. 1989.)

Study variables

Agribusiness relatedness of careers - Agricultural relatedness of careers is not a conceptually distinct categorization of careers. Its operational definition may differ widely depending upon the purpose. How does one know if his work is agribusiness related? The question is technically difficult to answer because there is no clear dividing line between those in agricultural research, production agriculture and production service industries whose activities are designed to supplement, complement, and in many cases replaces the labor and management input of the farmers (Rodefeld, 1982). As narrowly defined by the U.S. census, agribusiness careers are those that involve crop production and soil preparation services, veterinary and other animal services, farm labor and management services, landscape and horticultural services, forestry services, and crop marketing and management services (United States Bureau of the Census, 1980).

The operational definition used in this research is based on alumni's subjective identification of their first and current jobs as farming or agribusiness related. To determine the farming or agribusiness relatedness of the first jobs, respondents were asked: "Did your duties in your first full-time job involve farming or agricultural business in any way?" Three response categories were (1) No , (2) farming and (3) agribusiness related occupations. The categories were recoded as a dichotomous variable with 0 assigned to nonagricultural occupations and 1 to farming or agribusiness occupations. A code for current job was also developed. Graduates who

indicated that they are no longer employed in their first full-time job and who have a new job were asked again "Do your duties in your current job involve farming or agricultural business in any way?" The same dichotomous variable code as in the first job was used. If no new job is indicated, the code for first jobs will be adopted for the current job variable.

While subject matter differences are expected, no fundamental difference in the basic nature of work is expected between graduates in agribusiness related careers and their peers in nonagribusiness careers. However, to validate this assumption, three bivariate analyses will be conducted to examine if the groups differ on three variables - Data, People, and Things - that have been coded to index the nature of work. These are seven to nine point ordinal scales with the lowest value "0" indicating the most highly skilled category. On the data scale, the value ranged from (0) synthesizing to (6) comparing; the people scale ranged from (0) monitoring to (7) taking instruction; and the thing scale ranged from (0) setting up and precision work to (7) handling.

Educational attainment is the highest earned degree by respondents ranging from Diploma to Doctorate. The first educational question asked was "Did you complete a bachelor's degree at a college or university?" Response categories were (1) Yes and (2) No. One additional question asked "Have you completed any additional education beyond the bachelor's degree?". Response categories are(1) No, never completed or enrolled, (2) No, but plan to enroll in the future, (3) Yes, a master's degree, (4) Yes, a professional degree (M.D., D.V.M., etc.), (5) Yes, a Doctorate (Ph.D., Ed.D., etc.) and (6) Others (describe). By combining responses to

these two questions, all levels of education were recoded and assigned 1 of 5 categories: (1) Did not complete a B.Sc., (2) completed a B.S., (3) completed M.Sc. degree, (4) completed a professional degree, (5) completed a Ph.D.). In this research only categories 2 through 5 will be analyzed.

College major is the major course studied in college by respondents. This intervening variable is introduced to help clarify the conditions that are related to the decision to enter agribusiness related careers. It is operationalized as three dichotomous variables:

Traditional agricultural production sciences - If the major is agronomy or animal science it is coded (1) Yes or otherwise (0) No.

Traditional agricultural social sciences - If the major is Agribusiness, agricultural economics and agricultural education it is coded (1) Yes or otherwise (0) No. Nontraditional majors - if the major is applied engineering, fishery and biology, forestry, recreational or others it is coded (1) Yes or otherwise (0) No.

Farm background characteristics refers to the social farm background of respondents prior to enrollment in high school and college. Farm background is operationalized using categories identified in previous cross-sectional research (Lyson, 1979 and Molnar et al, 1981). Six background variables identified in previous cross-sectional studies will be examined. Fathers' educational attainment and mother's educational attainment are coded into eight ordinal categories: (1) Less than 9th grade; (2) Some high school; (3) Vocational training; (4) High school graduate; (5) Vocational training with high school; (6) Some college; (7) College graduate; and (8) Graduate work after college. Childhood

residence is coded into six ordinal categories: (1) On farm or ranch; (2) Outside city; (3) Town; (4) Small city; (5) Medium city; and (6) Metro city. Father's occupational status is coded from a low of 0 to 99 and is based on the Nam et al (1975) occupational code status scheme. Mother's work status is coded into three ordinal categories: (1) Working full-time; (2) Working part-time; and (3) Not working. Race is an eight category code that was recoded into two dichotomous variable. One for (1) White or (0) others and a second for (1) black or (0) others. Finally, agricultural courses offered in high school is a trichotomy: (1) Yes; (2) No; and (3) Don't know.

Economic activity in farming Variable - Some states have a higher proportion of economic activities in farming. Two operational definition are used. First is the percentages of the population that are rural farm residence. Second, is the percentage of total personal income from farming. From the data in Appendix A, it can be logically argued that agricultural graduates from states such as Kentucky, Oklahoma, Tennessee, Mississippi and North Carolina which have the highest percentage of rural farm residence or a high percentage of total personal income from farming are more likely to be in agribusiness related careers.

Two remaining dichotomous variables used as controls are gender and type of land-grant universities graduates attended. 1862 Land-Grant Universities: These are the universities established in 1862 to provide educational opportunities for youths from farm background following the passage of the Morril Act in 1862. Graduate from these institutions are coded as 1. 1890 Land-Grant Universities: These are the universities established to expand the federal government resources for agricultural

training for black youths following the second Morril Act passed in 1890. Graduate from these institutions are coded as 0.

Analytic strategy

First, tabular analysis is conducted to ascertain if the college of agriculture graduates in agribusiness related careers differ from their peers in nonagribusiness careers on the nature of their work with respect to Data, People, and Things. Since most variables are dichotomous and ordinal, Gamma which is a measure for ordinal level data is the measure of association (Elifson, 1982). Gamma may vary from -1.0 to +1.0. It is the difference in the number of agreements (Concordant pairs) and disagreements (Discordant pairs) as a ratio of the sum of the number of agreements and disagreements.

$$\text{Gamma} = C - D / C + D$$

Where C = number of concordant pair, and D = number of discordant pair. The reliability of the Gamma measures is double checked by comparing with pearson product moment correlation.

To statistically identify a set of characteristics that distinguish agribusiness from nonagribusiness job holders, a stepwise form of discriminant analysis based on the maximization of F-ratios and the minimization of wilk's lambda between group is used (Klecka, 1980).

Discriminant analysis is used for this purpose because it allows for a dichotomous nominal dependent variable (Agribusiness related and nonagribusiness related jobs). First, it extracts a discriminant function that represents the dimension along which the two groups differ. These discriminant function coefficients, when in standardized form,

indicate the relative importance of each predictor variable, analogous to the Beta weights in regression analysis. They serve to identify the variables that contribute most to the discriminant function and ultimately to the prediction of membership in one of two groups. The classification of respondents, the second valuable output, is a direct measure of the predictive accuracy of the group assignment. Stating this in other words, once the discriminant function has been extracted, it suggests how well the function correctly classifies the respondents in contrast to classification by chance (Klecka, 1980).

Findings

Relationships between agribusiness relatedness of jobs and the nature of work (complexity of task) dealing with Data, People, and Things of the study population were first examined, Table IA. Among the alumni whose first job was agribusiness related (AGB job) a near majority of 48.4 percent were involved in "coordinating" data tasks compared to 34.3 percent of nonAGB job holders. NonAGB job holders more often performed less complex data "compiling" tasks without the responsibility of coordinating analysis and other data tasks. Of their jobs, 29.3 percent were coded as compiling data versus 19.3 percent for AGB job holders. Other categories were more similar for both AGB and nonAGB job holders. Both the ordinal (Gamma) and interval (Pearson's r) measures of associations indicate a significant positive relationship at the .001 level between level of complexity of data task and AGB job. That is AGB job holders are more probably involved in coordinating several data management tasks than are nonAGB job holders on their first job. For those who changed jobs, their

current jobs are still similar in Data handling complexity but the differences between AGB and nonAGB job holders are no longer significant.

Regarding complexity of task dealing with people, among the AGB job holders, 55 percent were involved in speaking to people compared to 52.2 percent of nonAGB job holders (Table 1B). AGB job holders more often performed complex task of "supervising" or "instructing" People. Of their jobs, 20.3 percent were coded as "supervising" people versus 17.1 percent for nonAGB holders. NonAGB job holders more often performed less complex tasks of "taking instruction" without the responsibility of supervising people. Of their jobs, 14.7 percent were coded as "taking instruction" as one of the highest level of job complexity versus 7.3 percent for AGB job holders. Measures of associations indicate a significant positive relationship at the .001 level between the complexity of dealing with People and AGB job. This indicate AGB job holders are probably involved in more complex People related tasks on their first job. For those who changed their jobs, the two group are not significantly different in regards to complexity of task dealing with people.

Regarding the complexity of tasks dealing with Things, 60.4 percent of the AGB job holders were involved in "handling" things compared to only 47.5 percent of nonAGB job holders (Table IC). AGB job holders less often performed more complex task of "precision work" with things in addition to the responsibility of handling things. Of their job, 25.2 percent were coded as "precision work" versus 31.4 percent for nonAGB job holders. NonAGB job holders more often performed tasks of average complexity in dealing with Things. Of their jobs, 21.1 percent were coded as "manipulating" things versus 14.4 percent for AGB job holders. The

significant but negative relationship suggests that AGB job holders are probably involved in less complex tasks of handling things than are nonAGB job holders on their first job. The two groups are not significantly different on current job.

Suggestion on the roots of the differences observed on the first job may be found by introducing additional variables, gender, into the analysis. Perhaps, one might think, controlling for gender would diminish the differences in the nature of work. The findings, shown in Tables IIA, IIB, and IIC partially support such thinking. Among females, measures of associations indicate no significant relationship between the nature of work and agribusiness related of jobs at the .001 level. However, among the males, there is a significant positive relationship at the .001 level between AGB relatedness of job and complexity of Data task, complexity of work dealing with People, but significant negative relationship between AGB relatedness of job and complexity of work dealing with Things. For those who have changed jobs, there is no statistical difference. Thus we cannot conclude that the nature of work is different among the females with AGB and nonAGB jobs.

Agribusiness Relatedness of Jobs

Table III shows the standardized and unstandardized discriminant function coefficients for the variables that significantly discriminated between AGB and nonAGB job holders, the partial F's, group centroids, Wilk's lambda and the canonical correlation coefficients. The standardized coefficients of the discriminating variables indicate the conceptual framework based on college major, gender and economic activity in farming

play an important role in prediction of agribusiness job.

Gender and academic major were the two strongest dimensions in predicting AGB relatedness of job. The coefficient for female was -0.438 indicating that female were significantly less probable than males to be employed in an AGB first job. Traditional agricultural majors net of agribusiness majors and applied engineering majors was the strongest positive predictor of all with a coefficient of 0.949. The Agribusiness majors which were included in the traditional agricultural major coefficient as well had an additional positive effect of 0.277. Among the nontraditional production agricultural majors, applied engineering also had a 0.252 standardized coefficient.

The group centroid scores (.517, -.432), lambda (.817), and canonical correlation (.428) indicate that this function is most successful in distinguishing agribusiness related job holders from nonagribusiness related job holders and more importantly it correctly classified 69 percent of the cases. When compared to random assignment the function reduced classification error by 38.1 percent.

Table IV show the standardized and unstandardized discriminant function coefficients for the variables that significantly discriminate between AGB and nonAGB among those who changed jobs, the univariate F-ratios, group centroids, wilk's lambda and the canonical correlation coefficients. The partial F's for all the variables included in the table indicate that their probability of discriminating due to chance alone was less than .01. As on the first job, the standardized coefficient show that conceptual framework based on gender and academic major still play an important role in predicting AGB relatedness of current jobs. The

coefficient for female as a whole was -0.511 while that of black female was also a negative .204 indicating that females were significantly less probable than males to be employed in an AGB current job. Traditional agricultural majors net Agronomy major was the strongest positive predictor of all with a coefficient of 0.756. The Agronomy majors which were included in the traditional agriculture major coefficient as well had an additional positive effect of .230.

The canonical correlation (.302) and wilk's lambda (.909) indicated that these variables successfully discriminate among AGB and nonAGB job holders on their current job. Overall, 63.7 percent of the cases were correctly classified by the discriminant equation. This classification made 27.1 percent fewer errors than would be expected by random assignment of respondents among the two job groups.

In sum, more consistent with the results of the bivariate tests, agribusiness related job holders on both first and current jobs were discriminated by having majored in one of the traditional production agricultural and social science majors and by not being female. On the first job two set of variables were additional but minor significance. They were the nature of work with respect to the level of complexity of tasks dealing with Data and Things and the relative importance of agriculture in the economies of the states were the former students attended college.

Summary and Conclusions

This exploratory research was designed to explicate differences, if any, in the nature of work of agricultural college alumni in agribusiness and nonagribusiness related careers and at the same time determine predictors of agribusiness careers. Findings reveal that there were significant differences in the nature of work on the first full-time jobs graduates got upon graduation with respect to the complexity of Data tasks, complexity of work dealing with People and complexity of work dealing with Things. Compared to nonagribusiness job holders, Agribusiness job holders are more likely involved in coordinating several data management tasks, involved in more complex people related tasks of supervising or instructing but less complex tasks of handling things. However, as graduates gained experience on the job and move from one job to another, the initial entry level job differences almost disappeared except for gender differences.

Gender and academic majors were the strongest predictors of agribusiness jobs. The nature of work with respect to the level of complexity of tasks dealing with Data and Things and the relative importance of agriculture in the economies of the states were the former students attended college also displayed important explanatory power. It is important to note that though childhood place of residence (in rural areas or on farm) was an important predictor of farming career plans in previous studies, it was not an important predictor of the actual farming or agribusiness related careers. Further, the college women in this sample who were viewed as the vanguard of an increasingly significant and important movement into agriculture in the early 1980s (Lyson, 1981) are less likely to be in agribusiness jobs compared to their male peers after

graduation. Although unable to do so, the author believes future research into the career outcomes of these graduates should determine why these women and some men who graduated with a degree in agriculture went into nonagribusiness or farming related careers.

Several implications for rural sociologists who profiled the aspirations and expectations of these agricultural students during the 1970's are suggested by the results of this study. For those trying to explain the relationship between aspirations, expectations, family socioeconomic status and actual career destination, the result reinforce the idea that plans and expectations or aspirations for a particular occupation do not increase the probability of ones actual career destinations upon graduation from college.

For those interested in policy issues, the results may provide some useful suggestive information. Inspite of the fact that agricultural related career opportunities are about four times more prevalent than the number of graduates from land-grant universities (Coulter et al. 1986), many agricultural alumni entered nonagribusiness careers. Considering this, Deans of colleges of agriculture and their department heads should identify and correct weakness and deficiencies in placement of graduates in job markets.

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Table IA: Complexity of data tasks for nonagribusiness and agribusiness related jobs.

Level of job complexity	First job		Current job	
Data	Non agribusiness	Agribusiness	Non agribusiness	Agribusiness
	.....Percent.....			
Synthesizing	7.4	6.3	6.9	4.9
Coordinating	34.3	48.4	37.5	45.1
Analyzing	19.8	19.7	17.7	18.6
Compiling	29.3	19.3	28.9	22.3
Comparing	9.2	6.2	9.0	9.1
Total percent	100.0	100.0	100.0	100.0
Number	796	994	581	570
Gamma	-0.193		-0.072	
Pearson's r	-0.114		0.031	
Significance	0.000*		0.145	

*Significant at the .001 level

Table IB: Complexity of dealing with people for nonagribusiness and Agribusiness and related jobs.

Level of job complexity	First job		Current job	
People	Non agribusiness	Agribusiness	Non agribusiness	Agribusiness
	.....Percent			
Instructing	16.0	17.4	15.9	15.9
Supervising	17.1	20.3	20.4	22.7
Speaking	52.2	55.0	50.7	50.2
Taking instruction	14.7	7.3	13.0	11.3
Total percent	100.0	100.0	100.0	100.0
Number	824	1026	602	586
Gamma	-0.134		-0.039	
Pearson's r	-0.076		-0.025	
Significance	0.000*		0.194	

*Significant at the .001 level

Table IC: Complexity of dealing with things for nonagribusiness and agribusiness related jobs.

Level of job complexity	First job		Current job	
Things	Non agribusiness	Agribusiness	Non agribusiness	Agribusiness
	.....	percent	.....	
Precision work	31.4	25.2	29.1	24.2
Manipulating	21.1	14.4	17.5	19.0
Handling	47.5	60.4	53.3	56.9
Total percent	100.0	100.0	100.0	100.0
Number	829	1030	604	591
Gamma	0.199		0.081	
Pearson's r	0.108		-0.010	
Significance	0.000*		0.361	

*Significant at the .001 level

Table IIA: Complexity of data task for nonagribusiness and agribusiness related jobs controlling for gender.

Level of job complexity	First job		Current job	
Data	Non agribusiness	Agribusiness	Non agribusiness	Agribusiness
	.....Percent			
Female				
Synthesizing	4.6	6.9	5.7	3.2
Coordinating	26.3	30.5	25.1	31.9
Analyzing	20.5	21.8	19.4	17.0
Compiling	36.7	31.0	38.3	31.9
Comparing	12.0	9.8	11.4	16.0
Total percent	100.0	100.0	100.0	100.0
Number	259	174	175	94
Gamma	-0.124		0.000	
Pearson's r	-0.072		0.029	
Significance	0.007		0.316	
Male				
Synthesizing	8.8	6.2	7.4	5.3
Coordinating	38.2	52.2	42.9	47.7
Analyzing	19.6	19.3	17.0	18.9
Compiling	25.7	16.8	24.9	20.4
Comparing	7.8	5.5	7.9	7.8
Total percent	100.0	100.0	100.0	100.0
Number	537	820	406	476
Gamma	-0.159		-0.036	
Pearson's r	-0.094		-0.018	
Significance	0.000*		0.291	

*significant at the .001 level.

Table IIB: Complexity of dealing with people for nonagribusiness and agribusiness related jobs controlling for gender.

Level of job complexity	First job		Current job	
People	Non agribusiness	Agribusiness	Non agribusiness	Agribusiness
	..... Percent			
Female				
Instructing	16.5	15.5	16.9	12.6
Supervising	14.6	17.7	19.1	21.1
Speaking	54.8	56.9	50.6	54.7
Taking instruction	14.2	9.9	13.5	11.6
Total percent	100.0	100.0	100.0	100.0
Number	261	181	178	95
Gamma	-0.065		0.029	
Pearson's r	-0.035		0.018	
Significance	0.230		0.386	
Male				
Instructing	15.8	17.9	15.6	16.5
Supervising	18.3	20.8	21.0	23.0
Speaking	51.0	54.6	50.7	49.3
Taking instruction	14.9	6.7	12.7	11.2
Total percent	100.0	100.0	100.0	100.0
Number	563	845	424	491
Gamma	-0.144		-0.052	
Pearson's r	-0.081		-0.033	
Significance	0.000*		0.163	

*significant at the .001 level.

Table IIC: Complexity of dealing with things for nongribusiness and agribusiness related jobs controlling for gender.

level of job complexity	First job		Current job	
	Non agribusiness	Agribusiness	Non agribusiness	Agribusiness
	.....Percent			
Female				
Precision work	28.8	25.3	27.5	22.4
Manipulating	29.5	23.1	24.7	35.7
Handling	41.7	51.6	47.8	41.8
Total percent	100.0	100.0	100.0	100.0
Number	264	182	178	98
Gamma	0.142		-0.025	
Pearson's r	0.079		-0.005	
Significance	0.047		0.468	
Male				
Precision work	32.6	25.2	29.8	24.5
Manipulating	17.2	12.5	14.6	15.6
Handling	50.3	62.3	55.6	59.8
Total percent	100.0	100.0	100.0	100.0
Number	565	848	426	493
Gamma	0.201		0.093	
Pearson's r	0.107		0.054	
Significance	0.000*		0.049	

*significant at the .001 level.

Table III. Stepwise discriminant analysis for agribusiness related first jobs of land-grant alumni.

Variables	Standardized coefficients*	Unstandardized coefficients	Partial F 's
Data	-0.175	-0.116	6.15
Things	0.187	0.744	6.89
Percent rural farm residence(State)	0.259	0.233	8.53
Percent personal income from farming(State)	-0.187	-0.211	4.45
Female	-0.438	-1.053	38.87
Traditional majors(Agronomy, animal science,agribusiness and agric. economics)	.949	2.151	165.22
Applied engineering	0.252	1.004	11.03
Agribusiness major	0.277	0.881	14.44
Group centroids			
Agribusiness related jobs	0.517		
Nonagribusiness related jobs	-0.432		
Canonical correlation	0.428		
Wilk's lambda	0.817		
Degrees of freedom	8		
Significance of lambda	0.00		
Percent correctly classified			
Overall (1883)	69.0		
Agribusiness related jobs (1040)	74.1		
Nonagribusiness related jobs(843)	62.7		
Proportional reduction in error statistics(Tau)	38.1		

*Significant at the .01 level at time of first entry.

Table IV. Stepwise discriminant analysis for agribusiness related current jobs of land-grant alumni.

Variables	Standardized coefficients*	Unstandardized coefficients*	Partial F
Female	-0.511	-1.229	27.50
Black female	-0.204	-1.733	4.32
Agronomy	0.230	0.527	4.79
Traditional Agricultural majors(Agronomy, animal science,agribusiness and agric. economics)	0.756	1.649	54.04
Group centroids			
Agribusiness related jobs	0.319		
Nonagribusiness related jobs	-0.314		
Canonical correlation	0.302		
Wilk's lambda	0.908		
Degrees of freedom	4		
Significance of lambda	0.00		
Percent correctly classified			
Overall (1209)	63.7		
Agribusiness jobs (600)	72.0		
Nonagribusiness jobs (609)	55.2		
Proportional reduction in error statistics(Tau)	27.3		

*Significant at the .01 level at time of first entry.